

## Clinical Section

### Compound Fractures

by W. A. McELMOYLE, M.D., F.R.C.S. (Edin.)

*Lecturer in Surgery, University of Manitoba; Assistant Surgeon, Winnipeg General Hospital*

A compound fracture is a broken bone with an associated wound of the skin. The fracture may be in direct or indirect communication with the outside world. It is one of the real emergencies of surgery. The main element determining success is the time elapsing between the accident and the treatment.

Before Lister's time a compound fracture of one of the large bones of the body was usually followed by amputation of the limb and frequently this by death. Volkmann in 1877 estimated the mortality from all compound fractures in German hospitals to be 40%. In the first World War the mortality of compound fractures of the femur was 30%. This figure was given by Sir Anthony Bowlby.

The problems that confront one, when a compound fracture presents itself, are, in this order:—

- (a) General care of the patient.
- (b) Prevention or treatment of infection.
- (c) Care of the fracture.

#### Shock

A patient with a compound fracture is frequently shocked or suffering from multiple injuries. Treatment of shock must be instituted immediately, but should not be persisted in for too long a period to the detriment of the care of the fracture, unless the patient is in a moribund condition. Moderately severe shock from injury is frequently best treated by relieving the pain of the injury by an anaesthetic, either general or local. At this point I would like to stress the importance of adequate splinting of the limb while shock treatment is being instituted. On occasions one sees a patient being vigorously treated with heat, saline, etc., and a limb literally "folded" on itself, producing more shock.

#### Amputation

The question of amputation for compound fracture is important, and often a difficult one to decide, and on occasions a consultation should be arranged before such a step is undertaken or rejected. Bone injury in itself is usually not the deciding factor. Muscle or soft tissue damage often heals with amazing rapidity and recovery. The two main injuries are irreparable damage to nerves and interference with blood supply. If the main artery to a limb has been torn and part of the collateral circulation damaged it would be risking too much, in my opinion, to subject the patient to anything but an amputation, but this whole problem requires a great deal of judgment, and, as I have mentioned before, a consultation is

often of the greatest value. There are many ways to treat a compound fracture, and in the hands of their particular sponsors apparently give excellent results. Sherman of Pittsburg never hesitates to plate one, using Carrel-Dakins treatment with it. A word about Carrel-Dakins treatment—unless this procedure is carried out with the original technique, good results can not be expected. Daland of Boston has described what happened at the Massachusetts General in the following words,—"As time went on and the technique was handed down from intern to intern, and nurse to nurse, errors and new ideas crept in, until the results became unsatisfactory. On returning to the former technique, the results improved, and have remained good as long as one does not try to improve on the original methods." To go back to the various methods of treatment. Most people will not agree with the "immediate plating" school. Bohler just dismisses the subject by saying it is a mistake to do so, and that plating is never necessary. Personally I would not do so except under the most extenuating circumstances I feel this is a method of treatment which should be reserved for the most expert of enthusiasts.

X-Ray examination should never be omitted. Often one is tempted when the ends of the bone are projecting from the wound, to think the whole picture is before your eyes. This unfortunately is not true. The bones may be fractured longitudinally, a large slab may be loose underneath.

Antitetanic serum must always be given. This is especially true in penetrating wounds, due to missiles. Anti-gas gangrene serum may be given.

#### Chemotherapy

The use of Sulphanilamide either locally or generally as a preventative is still a debatable point. Apparently Sulphanilamide powder can be placed in a wound and not interfere with healing to any great extent, but insufficient time has elapsed, and too few cases have been observed to allow final judgment one way or another to be passed upon it.

The first aid treatment should be directed toward reduction of the fracture and splinting of the limb. The wound should only be covered with sterile gauze, not tampered with or flooded with antiseptics.

#### Illustrative Case

The method I have employed, and have so far found satisfactory, is that of mechanical cleansing, debridement, leaving the wound open, and the application of plaster. This method is well illustrated in the following case:—The patient, a

motorcycle delivery boy, was in an accident (August, 1936), sustaining a compound fracture of the medial malleolus, with medial dislocation of the talus. He was taken to the operating room, anaesthetized, the wound was covered with sterile dressings, and the leg and foot were scrubbed clean with soap and water. Gloves were then changed, and the wound was carefully washed with soap and water. Large quantities of water (several quarts) are necessary to thoroughly flush out the wound. This should take about 10 to 15 minutes. The area was dried with sterile swabs. The skin up to the wound was painted with iodine. None of this solution was allowed to run into the wound. The leg was draped, gloves and gowns changed, and debridement was undertaken. This is done on the theory that dead and dying tissue must be removed or they leave a culture media for the growth of the bacteria present in the wound. Tissues that cannot be washed clean must be removed, otherwise infection is liable to take place. The loss of tissue from infection is far greater than by surgical excision, and is certainly less under the control of the surgeon. Excision should be done with a knife in preference to scissors. The blades of scissors tend to crush, and consequently leave more damaged tissue than a knife.

When the injury was examined, a large flap of skin from the medial side of the leg, ankle and foot was missing. The medial malleolus was crushed to bone chips. The deltoid ligament was in shreds and had street dirt ground into it. The tubercle of the navicular and the insertion of the tibialis posterior tendon were in the same condition. The talus was dislocated medially out of the ankle socket. The articular cartilage on the medial facet was badly damaged.

The tendons of the tibialis posterior and flexor digitorum longus had become displaced, and had dirt ground into them. The skin edges were excised for about  $\frac{1}{3}$  of a cm. The medial malleolus and deltoid ligament were removed. That portion of tibialis post. tendon which was damaged, and the adjoining portion of the navicular, was cut away. The medial facet of the talus was removed with an osteotome. The posterior tendons were shaved with a knife, removing the part where dirt had been ground in. The dislocation was reduced. The few bleeding points were picked up and tied with very fine catgut. A large skin deficiency was left. It was impossible to even attempt closure. A piece of gauze smeared with vaseline was laid over the wound, and a plaster dressing from toes to thigh was applied. This boy's temperature for 3 or 4 days fluctuated between 100 and 103°, but at no time did he appear ill. Pain was not severe. His temperature settled down, and his leg became painless. He was kept in bed for about a month. The plaster was never changed, although discharge had soaked through it. He was sent home on crutches, and in another six weeks the cast was removed. I very foolishly did this in my office—the stench was terrific. The wound was completely healed. No weight bearing was allowed for two

months. The shoe was adjusted and a good ankle and foot were obtained. He had at least a 90% functional result.

This was a severe injury, and had infection taken place there would have been a very poor result.

This method of treatment should only be used for those cases seen in the early stages, say within twelve hours from the time of injury.

### Late Cases

Late cases are a very difficult problem. Chemotherapy in the form of Sulphanilamide or related compounds may be of great value. One must always consider a compound fracture twelve hours old as an infected wound, and treat it as such. If the infection is minimal, so much the better, but no operative treatment should be carried out. Carrell-Dakins treatment is of great value here. In these late cases, or in frankly infected ones, the question of amputation crops up again. The indications here are:—

(a) Spreading infection which can not be controlled.

(b) Osteomyelitis.

(c) Gangrene, either from interference with blood supply or due to anaerobic infection.

(d) Secondary haemorrhage. The occurrence of this complication is extremely serious. High ligation is usually done, and this will necessarily cut down the blood supply to an area where a good circulation is urgently required. The patient is suffering from infection and loss of blood, and the danger to life is great. Amputation often offers the surest and quickest means of saving life at the expense of a limb. The social status, the work done by the patient, the limb involved, are all factors that sway one's judgment.

The method advocated for early open fractures is a result of the work of many surgeons. Friedrich in 1898 advocated excision of the wound. During the first World War Leriche and Pollicard and others advocated debridement. Winnett-Orr combined this with occlusive plaster, so that further infection is not introduced by dressings. The presence of pus or discharge in an open wound is not a disadvantage. It is part of the process of healing, and there are no indications for it to be wiped away. This fact was known to both Ambrose Paré and John Hunter. It is likely that the bacteriophage content is very high, and that it actually exerts a beneficial action.

Trueta in the Spanish Civil War used this method extensively, and has published very glowing accounts of it. Papers more recently published by French surgeons, Ricard, Creysell, Arnaud and others, are not so glowing, but one must take into account the bad conditions in Barcelona at the time—lack of food, hospital accommodation, etc., and then these cases, long before they were in any condition to be moved, started a long retreat toward France.

This is the only treatment I have ever used for compound fractures, and in my brief experience has always proved satisfactory.

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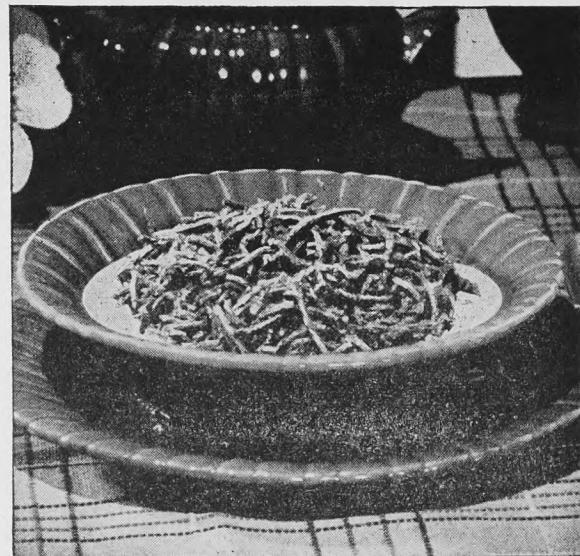
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## Editorials and Association Notes

### The Manitoba Medical Review

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sanctioned by the Manitoba Medical Association*

### The Canadian Medical Association Meeting in Winnipeg Goes Over "With a Bang"

The seventy-second Annual Meeting of the Canadian Medical Association held June 23rd to 27th in Winnipeg "went over the top in a walk", if the expressions of appreciation from the visiting physicians are any indication of its success. Some 776 physicians registered and 247 of them brought their wives. All the meetings were held in the Royal Alexandra Hotel.

The General Council was in session all day Monday and Tuesday forenoon. The surprise sprung on the Council was information to the effect that the Department of Pensions and National Health was considering bringing in a bill for some form of Health Insurance at the next session of the Federal Parliament. Little information seemed available on the subject, but it is one that no doubt will be filled with interest for the incoming Executive.

At the meeting Tuesday morning Dr. A. E. Archer of Lamont, Alberta, was elected to the office of President-Elect, and Jasper, Alberta, was chosen as the meeting place for June, 1942. A long agenda, each subject touching intimately the practice of medicine, was concluded by noon Tuesday, the 24th.

The Saskatchewan Division of the Canadian Medical Association, who were kind enough to move their Annual Meeting to Winnipeg, met Tuesday afternoon. The Manitoba Division also held their Annual Meeting the same afternoon when Dr. H. D. Kitchen was elected to the Presidency.

The scientific programme was carried out satisfactorily, and the attendance at sections and general sessions was larger than had been anticipated. The Round Table Conferences seem to be growing in popularity.

The guest speakers, Dr. Wm. F. Braasch, of Rochester, Minn.; Dr. R. M. Tovell, of Hartford, Conn., and Dr. Rustin McIntosh, of New York, all contributed handsomely to the programme.

Three luncheons were held Wednesday, Thursday and Friday, the respective speakers being President Sidney Smith of the University of Manitoba; Dr. E. L. Ross, President of the Manitoba Medical Association, and Brigadier R. M. Gorssline, Director General of Medical Services for the Department of Defence of the Dominion Government. Between 400 and 500 attended each of these luncheons filling the large dining room of the hotel. Brigadier Gorssline made it clear that they need more medical men in the army, and made an appeal to the profession to co-operate in supplying the necessary doctors; surely this is a challenge to the medical profession of the country.

The very large attendance at the evening meeting following dinner on Thursday, speaks well for the interest of the profession at this time in Medical Economics, which was the subject of the evening. Following the presentation of the golf prizes, the President turned the chair over to Dr. Wallace Wilson of Vancouver, Chairman of the Committee on Medical Economics of the Association, and a symposium on the subject was led by Dr. R. O. Davison of Regina, Saskatchewan; Dr. E. S. Moorhead, Winnipeg; Dr. T. C. Routley, Toronto, and Mr. Hugh H. Wolfenden, Toronto, Consulting Actuary of the Association.

At the Annual General Meeting Wednesday evening, His Honour the Lieutenant-Governor and Mrs. R. F. McWilliams were present. Senior members from the different provinces were admitted, and official delegates were received.

Dr. E. W. Montgomery was admitted to Honorary Membership, a distinction which is held by only one other living Canadian.

The feature of the evening was the induction of the President, Dr. Gordon S. Fahrni, who in a short address touched upon several questions each of which stood out as a challenge to the profession.

At the conclusion of the formalities a reception was held followed by a dance and supper.

Although the weather was hot all the social functions went off very well, and the Ladies' Committee is to be congratulated on its splendid performance, as they had provided receptions, teas, breakfasts, luncheons and dinners (properly assorted), to suit the tastes of the most fastidious.

The reception of Dr. and Mrs. Gordon Fahrni on Wednesday afternoon at the St. Charles Country Club, in spite of the heat, was attended by approximately five hundred, and the attendance at the reception the following afternoon by His Honour the Lieutenant-Governor and Mrs. R. F. McWilliams at Government House, was very high also.

Plans for this meeting began early in the Fall of 1940, when the President-Elect called a meeting of the officers of the different branches of Organized Medicine in Manitoba, and discussed with them the importance of the profession in Manitoba considering themselves hosts to the meeting, and suggested an Advisory Committee be set up with representatives from the different branches of Organized Medicine in this province. With this end in view a Committee was struck consisting of representatives from the Manitoba Medical Association, the College of Physicians and Surgeons of Manitoba, The Faculty of Medicine, University of Manitoba, the Winnipeg Medical Society, and three representatives from the District Medical Societies, representing the South, North and West, as well as the appointed Manitoba Representative on the Canadian Medical Association Executive. A meeting of this Committee was called and officers of the various Committees and Sections were then appointed, all of which constituted the Committee on Arrangements.

To this group of men a great deal of credit is due for the highly successful meeting, testimony to which is given by the flood of "thank you" letters received from visitors by the President, Dr. Gordon Fahrni, and many of his Committee.

## OBITUARY

### DR. HARRY CLARKSON CUNNINGHAM

Dr. Harry Clarkson Cunningham, pioneer surgeon of Carman, Manitoba, died at his home on July 2nd after a brief illness. He had attended the annual meeting of the Canadian Medical Association in Winnipeg the previous week. Born at Kingston in 1864, he graduated in medicine from Queen's University in 1885 and went to Carman the following year. Except for time spent abroad in post-graduate work, he practised continuously at Carman over a wide territory. He enjoyed not only the respect of his patients but also the esteem of his fellow practitioners. He was called frequently in consultation and served on numerous occasions as an examiner in surgery. He was one of the founders of Carman General Hospital, and in 1940 he was made an honorary life member. He

was a Fellow of the American College of Surgeons. His son, Dr. E. K. Cunningham, also practising in Carman, survives him, as do his widow and two daughters.

Dr. Cunningham was one of the grand old medical pioneers of the province. He represented all that is good in the medical profession and because of that his name was a household word in southern Manitoba.

## American College of Surgeons To Hold Clinical Congress in Boston

The thirty-first annual Clinical Congress of the American College of Surgeons will be held in Boston November 3 to 7, with headquarters at the Statler and Copley-Plaza hotels. The twenty-fourth annual Hospital Standardization Conference sponsored by the College will be held concurrently. About five thousand surgeons and hospital executives from all parts of the western hemisphere are expected to gather in Boston for these meetings, the program for which will include clinics and demonstrations in local hospitals and medical schools, as well as scientific sessions, conferences, medical motion picture showings and exhibits in the headquarters hotels.

The Chairman of the Board of Regents of the American College of Surgeons is Dr. Irvin Abell of Louisville and the President is Dr. Evarts A. Graham of St. Louis. The President-Elect is Dr. W. Edward Gallie of Toronto, who will be inaugurated at the presidential meeting and convocation to be held the evening of November 3 in Symphony Hall, when several hundred initiates will be received into the fellowship of the College. In charge of local arrangements for the Clinical Congress is a committee of Boston surgeons headed by Dr. Leland S. McKittrick, Chairman, and Dr. Richard H. Sweet, Secretary.

Headquarters of the American College of Surgeons, which has a fellowship of more than 13,000 surgeons, are at 40 East Erie Street in Chicago. The associate directors are Dr. Bowman C. Crowell, who heads the Department of Clinical Research, and Dr. Malcolm T. MacEachern, Chairman of the Administrative Board and in charge of hospital activities.

## GOLF

Winnipeg Medical Golf Association will hold their next monthly tournament on Wednesday, August 20th, at Pine Ridge.



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## Personal Notes and Social News

Conducted by *Gerda Fremming, M.D.*

Dr. George Mackay, son of Mr. and Mrs. James Mackay, of Winnipeg, has received his F.R.C.S. degree from the Royal College of Surgeons, Edinburgh, Scotland. Dr. Mackay is a graduate of the Faculty of Medicine, University of Manitoba.

♥    ♥    ♥

Captain M. T. Kobrinsky, R.C.A.M.C., after spending a short time in Winnipeg, and attending the C.M.A. convention, has returned to his post in Newfoundland.

♥    ♥    ♥

Invitations to the marriage of their daughter, Laura Evelyn, to Mr. Robert Lee O'Brien, son of Mr. and Mrs. Robert O'Brien, have been issued by Dr. and Mrs. Bernard R. Mooney, which is to take place August 9th at 9 a.m. at St. Ignatius church.

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Word has been received from Maidenhead, Berks, England, of the birth of a son, to Capt. and Mrs. A. R. Turner. Mrs. Turner was formerly Miss Betty Tod, of Winnipeg.

♥    ♥    ♥

Dr. Lois Kennedy, of Muffreesborough, Tenn., arrived by plane and is the guest of her parents, Mr. and Mrs. J. B. Kennedy, Ste. 8, Blackstone Apts.

♥    ♥    ♥

Dr. Norman Irwin Corne, son of Mr. and Mrs. I. Corne, is to be married August 10th to Margaret Copp, daughter of Mrs. J. Birkenthal and the late Mr. S. Copp.

♥    ♥    ♥

Dr. and Mrs. Gordon Chown are enjoying a short visit from their son, Pilot Officer Douglas Chown, at their summer home, Coney Island, Lake of the Woods.

♥    ♥    ♥

Dr. and Mrs. B. J. Brandon's niece, Miss Margaret Bjornson, daughter of the late Dr. and Mrs. Olafur Bjornson, was married July 19th to Mr. Alan H. Adamson, son of Mrs. Adamson and the late Mr. C. A. Adamson.

♥    ♥    ♥

Dr. and Mrs. W. W. Musgrove have returned to Winnipeg after holidaying at Victoria, Vancouver and Jasper Park Lodge.

♥    ♥    ♥

Dr. Stewart McInnes has returned to the city from the Lake of the Woods.

♥    ♥    ♥

Dr. and Mrs. C. M. Strong spent a pleasant holiday at Cypress Hills, Alta. They were accompanied by Dr. Strong's sister, Mrs. J. Boyd, of Toronto.

Dr. and Mrs. D. L. Johnson, of Brandon, Man., spent their vacation at Clear Lake, Man.

♥    ♥    ♥

Dr. M. Ellen Douglas has returned from the Pacific Coast where she attended the convention of the Professional and Business Women's clubs.

♥    ♥    ♥

Dr. and Mrs. J. C. Hossack have returned to Winnipeg after spending a holiday at Banff and Jasper Park.

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Dr. and Mrs. William Ormond, of Calgary, Alta., who had been holidaying with Dr. Ormond's mother at her summer home at Minaki, Ont., have returned home.

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Dr. C. V. McClelland, formerly of Dominion City, is now practicing at Emerson, Man.

♥    ♥    ♥

The following doctors have enlisted with His Majesties Forces: J. G. Barrie; G. B. McTavish; F. B. McIntosh, of Emerson, Man.; H. Meltzer, of Ninette, Man.; J. D. Leishman, of Fort Frances, Ont., and I. J. Matas, of Selkirk, Man.

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Dr. René Letienne has commenced practice in St. Boniface, Man.

♥    ♥    ♥

Dr. Kenneth C. Johnston, son of Mr. and Mrs. W. M. Johnston, of Wilcox, Sask., is to be married August 8th to Ione, eldest daughter of Mr. and Mrs. R. A. Lattimore.

♥    ♥    ♥

Major (Dr.) Bruce H. Chown, Superintendent of the Winnipeg Sick Children's Hospital has been appointed second-in-command of the 16th Field Regiment, R.C.A.

♥    ♥    ♥

The wedding of Dr. N. W. Warner, son of Mrs. A. Warner, of Winnipeg, and the late Mr. Warner, to Alice Frances, daughter of the late Mr. and Mrs. John Morgan, of Somerville, Mass., took place July 2nd in Somerville, Mass. Dr. and Mrs. Warner honeymooned in the New England States and returned to Winnipeg through Eastern Canada.

♥    ♥    ♥

Dr. and Mrs. Dan. Hossack are receiving congratulations on the birth of a son, Daniel Robert.

♥    ♥    ♥

Dr. and Mrs. Kenneth Massey, formerly of Ashcroft, B.C., are now residing at Kamloops, B.C. Mrs. Massey was formerly Miss Corrine Saunderson, of Winnipeg.

## Department of Health and Public Welfare

### ACUTE ANTERIOR POLIOMYELITIS

We believe that in view of the fact there has been an increase in the number of Poliomyelitis cases reported to date this year it would be opportune to reprint the following article on "Immunity Problems of Poliomyelitis" by Doctor F. C. Cadham, B.A., M.D. (Manitoba), F.R.C.P. (C.), Professor of Bacteriology, University of Manitoba; Bacteriologist, Department of Health and Public Welfare, Manitoba:—

### IMMUNITY PROBLEMS OF POLIOMYELITIS

Poliomyelitis is a disease of paradoxes. It is called infantile paralysis, but infants are comparatively immune and adults are frequently stricken, especially in this epidemic. Some believe the disease is highly infectious, yet only one child of a group or one person in an isolated community may be attacked. It is a disease of the summer months in temperate climates and comparatively rare in the tropics. It kills or paralyses in a short space of time or leaves the patient apparently unharmed. The immunologic reactions fail to conform to what we would expect of a virus disease.

The immunology of this disease is of such amazing complexity that it would be impossible and of little value at the moment to discuss these difficult and controversial problems.

The infective agent, a virus estimated to be about 0.2 microns in size, has been isolated and cultured and from the culture the disease has been again transmitted, thus fulfilling Koch's postulate. It has been established that the virus enters through the nasopharynx, travels largely if not exclusively by the neural pathways. Acute-poliomyelitis involves the grey matter of the spinal cord, the nuclei of the brain stem and the walls of the third ventricle. The prodromal symptoms indicate an initial systemic invasion.

As a rule sudden in onset and as suddenly over, death, paralysis or recovery. What occurs? — is the virus destroyed in the body by similar processes of immunity that occur in other infectious diseases — by leukocytic activity — there is little evidence — by humoral activity — possibly, but if so, it is obvious that the development of antibody immunity needs must be startlingly rapid. Experience shows that in other infectious diseases time is required for the development of antibodies. These fundamental problems of the disease have been subject to an immense amount of experimental work in an attempt to determine or evolve some sound method of prevention or therapy.

#### Transmission

How is the virus transmitted? Peculiarly seasonal in incidence, naturally attention is directed to a possible insect vector, but no insect has been incriminated; in fact, epidemics have occurred in localities and at times that would appear to exclude such a type of vector.

The belief is that it is transmitted by healthy human carriers. The virus has been repeatedly recovered from the nasopharynx of persons in normal health. Can we isolate these carriers? At present by no known practical method. Why do not these people succumb to the disease? Possibly because they have a general immunity or a local tissue immunity of the nasopharynx, or possibly an anatomical mechanical factor is present that prevents the invasion of the virus.

Practical application of the principle involved in the mechanical blocking of the paths of ingress has recently been attempted by applying to the nasopharynx antiseptics that congeal the secretions — picroic acid, tannic acid, alum, mercurochrome or alcohol.

### Immunization

At once, since it is a virus disease, we consider the possible active immunization of the population as practised to control smallpox. Kolmer has prepared and administered an attenuated vaccine of the virus. Brodie has used a killed culture. Twenty thousand persons are said to have received these vaccines. Nine cases with five deaths occurred in this group, and Dr. Leake of the United States Public Health Service points out that although any one of these cases may have been unconnected with the vaccine, the implication of the series as a whole is clear. At present we must hesitate. I believe, however, that our hope in conquering this dread malady lies in the further improvement of this method.

Failing active immunization, the question of passive immunization arises. Up to the present efforts to immunize animals so that a neutralizing antibody of high titre might be obtained have failed; the virus lacks antigenic value for animals. However, this line of investigation also is of promise.

Finally, we must consider the transference of human serum which is known to contain neutralizing antibodies.

THAT these neutralizing substances appear in the blood following an attack of poliomyelitis has been abundantly demonstrated. They have also been demonstrated in the blood of over 80 percent of adults who have no recollection of having suffered from an attack of poliomyelitis and to complicate the question further these neutralizing substances have been found present in horse serum, venom serum and placental extracts.

It is conceived that the persons who have not suffered from the disease but whose blood shows the presence of antibodies have been immunized by a non-symptomatic attack, possibly by an attenuated type of the virus. We have here an analogy to diphtheria — the high protective power of the infant, low antibody content of the blood after one year of age, gradually rising in the general population to adult life; however, in poliomyelitis the problem becomes involved, since persons in whose blood neutralizing substances have been present have been known to contract the disease. Moreover, there are 17 cases on record of a second attack.

It is established that the transfer of human serum is the only practical method of therapy aside from prevention that at present is available.

### Value of Convalescent Serum

The efficacy of convalescent serum in poliomyelitis is the subject of controversy. Park of New York scouted the value as the result of a summary of observations made in the New York epidemic of 1931, even though the statistics of that epidemic indicated less paralysis and a lower death rate in the treated cases; later the New York Academy of Medicine pointed out the untreated group of cases recorded for statistical purposes were a much milder group than the treated group.

Brodie of New York stated he was doubtful if beneficial results were obtained by the experimental method in monkeys, but, as has been pointed out, the results observed in the therapeutic tests of the serum on monkeys does not necessarily postulate that the same would hold for the human type of the disease. On the other hand, Schultz and Gibbard using convalescent serum reduced the death rate in monkeys by 23 percent. It is of interest to note that while monkeys are highly susceptible to the virus not all are so; the spider monkey of South America appears to be resistant.

Abundant evidence exists that benefit follows the administration of convalescent serum. In the California epidemic, the Manitoba epidemic of 1928, the Michigan epidemic, the Chicago cases and in the Australian epidemic favourable results were noted following the use of convalescent serum. Jensen, describing the extensive epidemic in Denmark of 1935, states "There is a direct and positive justification for the use of serum, in that skilled observers independently again and again have made the clinical observation of a prompt improvement of the general condition of the patient following serum therapy. In a number of cases this improvement was both subjectively and objectively so prompt that the influence of serum was almost unquestionable."

In a recent editorial review of this subject in the Journal of the American Medical Association this statement is made — "If future epidemic results can duplicate those mentioned, the treatment of acute poliomyelitis will be satisfactory and harmless to the patient. There is no other treatment that is even of debatable value. The early and continued use of orthopedic measures will improve results in the acute paralytic disease and in cases in which only paresis appears," and Harmon in a recent comprehensive review of the subject of poliomyelitis states "Convalescent and other specific serum therapy should be continued as there is no evidence that it is not of value, on the other hand symptomatic improvement following the administration of the serum is almost universal."

During the past seventeen years we have prepared convalescent serum in the Provincial Laboratory; my experience over that period leads me to believe that the treatment is decidedly valuable. Over 1,200 patients have been treated by the serum from the Manitoba Provincial Laboratory and the records of results are uniformly favourable.

It is accepted that the serum is valuable only when administered in the pre-paralytic stage. Physicians frequently tax me with the question "how can you judge results when the serum is given early, probably the patient may never have had poliomyelitis and the statistics are then misleading, only apparently proving the value of the serum." Strange to say, this factor works in exactly the opposite way. Let me explain. In the epidemics in Manitoba twice the number of vials of serum have been administered as there are cases reported. I estimate of the number of cases treated but unreported some 15% to 20% may not have had poliomyelitis but the other 80% or over had poliomyelitis. A number of these patients showed all the clinical symptoms, including high cell count in the spinal fluid. Sick a day, serum, recovery the next day. Now if the records are taken from the reported cases — and they have been — what then of the other 80% of recovered cases?

I do not believe the serum treatment even in the pre-paralytic stage is infallible. Far from it. Neither is anti-diphtheritis serum infallible. There probably exists a fulminating type of the infection in which no form of therapy is of avail; then, too, who can determine at what moments the nerve tissue may have been damaged past repair. The element of time appears to be the important factor; early diagnosis, early treatment. The sudden onset and sudden result demonstrate all too clearly the rapidity of the development of immunity, or its failure. In the abrupt battle, if we stimulate the defensive mechanism of the body even slightly, it may be the deciding factor for a fortunate outcome. I am not convinced that the benefit obtained by the use of the convalescent serum depends entirely upon the passive transference of virus neutralizing substances.

#### Administration of Serum

A constant demand arises for the serum for prophylactic purposes. A two weeks' immunity might be so transferred and even that is questionable. Then, too,

some physicians do not understand why we cannot keep all supplied with serum to hold in reserve.

EVERY PATIENT IN MANITOBA SO FAR AS WE KNOW IN THE PAST SEVENTEEN YEARS HAS BEEN ABLE TO OBTAIN THE SERUM WHEN NECESSARY AND WE WILL ENDEAVOUR TO KEEP UP THAT RECORD, BUT I TRUST THAT THE PROFESSION WILL NOT TAKE IT AMISS IF I REMIND THEM THAT THE SERUM IS NOT READILY COME BY AND IT IS DIFFICULT AND EXPENSIVE TO PREPARE.

I prepare the serum by a different method than is adopted in other centres and have advised the intramuscular route of administration. This advice was based on my experience with the experimental production of antibodies in animals. Howitt of the University of California has since confirmed experimentally the efficiency of this method of administration of convalescent serum in contradistinction to the intravenous or intrathecal route.

We distribute a pooled serum in vials. The serum is obtained from the blood of selected donors. A Wassermann test is made on each blood. I recommend the administration of the entire contents of the vial. As a rule physicians have limited the amount given to infants. A 20 cc. all-glass syringe is required. We also request that once a vial is opened or partly used that the remainder of the contents be discarded.

#### COMMUNICABLE DISEASE REPORT

May 21st - June 17th, 1941

**Chickenpox:** Total 399—Winnipeg 305, Transcona 28, St. James 13, Dauphin Town 10, Unorganized 7, Rockwood 4, Kildonan East 1, Lakeview 1, Sifton 1, Ste. Anne 1, St. Boniface 1, Tuxedo 1 (Late Reported: Transcona 4, Lakeview 1, St. Boniface 1).

**Measles:** Total 315—Winnipeg 183, Kildonan East 21, Flin Flon 15, Dauphin Town 13, Rockwood 10, Rivers Town 8, St. Boniface 8, St. James 8, Kildonan West 7, Pipestone 7, Wawanesa 4, Brenda 3, Melita 3, Blanshard 2, Portage City 2, Rhineland 2, Transcona 2, Unorganized 2, Daly 1, Fort Garry 1, Grey 1, Minnedosa 1, Norfolk South 1, Ochre River 1, Roblin Village 1, St. Vital 1, Tuxedo 1, Woodlands 1 (Late Reported: Flin Flon 2, Dauphin Town 1, Hillsburg 1, Morris Rural 1).

**Mumps:** Total 109—Winnipeg 45, Flin Flon 19, Kildonan West 4, Brenda 3, Dauphin Town 2, St. Boniface 2, Brandon City 1, Portage City 1, Swan River Rural 1, Transcona 1 (Late Reported: Flin Flon 8, Dauphin Town 1, Dauphin Rural 1).

**Tuberculosis:** Total 56—Unorganized 10, Winnipeg 5, Selkirk Town 4, St. Clements 3, Brandon City 2, Edward 2, Grey 2, Hanover 2, Kildonan East 2, Portage City 2, St. Andrews 2, St. Boniface 2, The Pas 2, Argyle 1, Brenda 1, Coldwell 1, Cypress South 1, Dufferin 1, Elton 1, Morris Rural 1, Minitonas 1, Mossey River 1, Oakland 1, Rossburn Rural 1, Shoal Lake Rural 1, St. James 1, St. Paul West 1, St. Rose Rural 1, St. Vital 1.

**Scarlet Fever:** Total 36—Winnipeg 20, Unorganized 5, Portage 3, Kildonan West 2, Norfolk South 1, Portage Rural 1, Shell River 1, St. James 1 (Late Reported: Portage City 2).

**German Measles:** Total 19—Brandon City 12, Hanover 2, Portage City 2, Pipestone 1, Tuxedo 1, Unorganized 1.

**Whooping Cough:** Total 11—Minnedosa 2, Brandon City 1, Ochre River 1 (Late Reported: Brandon 6, Hanover 1).

**Diphtheria:** Total 10—Winnipeg 2, St. James 2, Cartier 1, Charleswood 1, St. Clements 1, St. Vital 1, Rhineland 1 (Late Reported: Pilot Mound 1).

**Pneumonia Lobar:** Total 9—Brandon City 1, Unorganized 1 (Late Reported: Lac du Bonnet 1, Archie 1, Ste. Rose Rural 1, Winnipeg Beach 1, Unorganized 1, Brenda 1, Selkirk 1).

**Erysipelas:** Total 2—Winnipeg 1 (Late Reported: Lakeview 1).

**Septic Sore Throat:** Total 2—Brandon 1, Portage Rural 1.

**Treaty Indians:** Total 10—Tuberculosis 6, Influenza 2, Diphtheria 2.

**Venereal Disease:** Total 112—Gonorrhoea 78, Syphilis 33, Chancroid 1.

#### DEATHS FROM COMMUNICABLE DISEASE May, 1941

**URBAN**—Cancer 45, Tuberculosis 14, Pneumonia Lobar 4, Pneumonia (other forms) 10, Syphilis 7, Tetanus 1, Cerebrospinal Meningitis 1, other deaths under one year 21, other deaths over one year 163, Stillbirths 18. Total 285.

**RURAL**—Cancer 29, Tuberculosis 16, Pneumonia Lobar 2, Pneumonia (other forms) 9, Whooping Cough 3, Influenza 1, Syphilis 1, other deaths under one year 27, other deaths over one year 168, Stillbirths 19. Total 275.

**INDIAN**—Tuberculosis 11, Pneumonia Lobar 1, Pneumonia (other forms) 7, other deaths under one year 4, other deaths over one year 4, Stillbirths 2. Total 29.

Disease	Manitoba May 21 to June 17	Ontario May 18 to June 14	Saskatchewan May 18 to June 14	Minnesota May 18 to June 14
Anterior Poliomyelitis	1			1
Meningococcal Meningitis	38	8	1	
Chickenpox	373	877	154	387
Diphtheria	9	11	4	13
Erysipelas	1	7	13	3
Influenza		79	23	7
Leth. Encephalitis				2
Measles	310	5,261	236	77
German Measles	19	2,058	80	
Mumps	99	616	145	
Pneumonia (Lobar)	2	58		78
Scarlet Fever	34	619	44	176
Septic Sore Throat	2	22		
Smallpox			1	1
Trachoma			2	
Tuberculosis	56	185	32	118
Typhoid		7		6
Typh. Para-Typhoid			11	
Undulant Fever		6		1
Whooping Cough	4	589	9	339
Tetanus		1		

#### TRY PABLUM ON YOUR VACATION

Vacations are too often a vacation from protective foods. For optimum benefits a vacation should furnish optimum nutrition as well as relaxation, yet actually this is the time when many persons go on a spree of refined carbohydrates. Pablum is a food that "goes good" on camping trips and at the same time supplies an abundance of calcium, phosphorus, iron and vitamins B<sub>1</sub> (thiamine) and G (riboflavin). It can be prepared in a minute, without cooking, as a breakfast dish or used as a flour to increase the mineral and vitamin values of staple recipes. Packed dry, Pablum is light to carry, requires no refrigeration. Here are some delicious, easy-to-fix Pablum dishes for vacation meals:

##### PABLUM BREAKFAST CROQUETTES

Beat three eggs, season with salt, and add all the Pablum the eggs will hold (about 2 cupfuls). Form into flat cakes and fry in bacon fat or other fat until brown. Serve with syrup, honey or jelly.

##### PABLUM SALMON CROQUETTES

Mix 1 cup salmon with 1 cup Pablum and combine with 3 beaten eggs. Season, shape into cakes, and fry until brown. Serve with ketchup.

##### PABLUM MEAT PATTIES

Mix 1 cup Pablum and 1½ cups meat (diced or ground ham, cooked beef or chicken), add 1 cup milk or water and a beaten egg. Season, form into patties, and fry in fat.

##### PABLUM MARMALADE WHIP

Mix ⅔ cup Pablum, ¼ cup marmalade, and ¼ cup water. Fold in 4 egg whites beaten until stiff and add 3 tablespoons chopped nuts.

Sulfaguanidine, the new sulfonamide compound which clinical trial indicates may be of great usefulness in certain diseases of the gastrointestinal tract, has been released for sale by E. R. Squibb & Sons, New York. It is supplied in 0.5 gram tablets, in bottles of 50, 100 and 1,000, and as a powder in 4-ounce and one-pound bottles; also in 3.5 gram envelopes in packages of 12.

Sulfaguanidine is distinguished from other sulfonamide derivatives by its low absorbability. This causes it to remain in the intestinal tract and exert its anti-bacterial influence therein. Consequently, it is useful in enteric infections, such as acute bacillary dysentery, and also as a preoperative and postoperative measure in surgery of the lower intestinal tract.

Like the other sulfonamides, Sulfaguanidine has high anti-bacterial activity. Unlike them, and in spite of its relative solubility in water, it diffuses to a much less extent through the intestinal wall. It is, therefore, possible to obtain a relatively high effective concentration of the drug in the intestine itself (200 mg. per cent.) with little penetration into the circulation and consequent systemic effects (1 to 4 mg. per cent. concentration in the blood).

A tasteless drug, Sulfaguanidine is administered either in tablet form or as powder in water or similar medium. Rather large doses appear to be required; even for children, but the total period of treatment should not exceed 14 days.

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